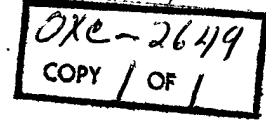


Trip Report
Washington, D. C.
11/9/61



Meeting on Project Data Recording Requirements

Present: Myron K.
Charles K.
John W. (computer interests)
Gene R. (photogrammetry interests)
Ralph P. (operations)
R. L. L.

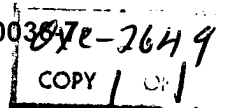
The meeting had been called at a very opportune time. Myron K. had just sent Charlie K. a memorandum defining data requirements for project missions. Major points of interest listed in the memo were as follows:

1. Z time of exposure.
2. Precise time between stereo-conjugates to establish exact air base distance.
3. Fan sweep rates to determine exact times for an image at any given location in a frame.
4. Altitude.
5. Vehicle velocity.
6. Lens calibration and distortion.
7. Orientation data:
 - Pitch
 - Roll
 - Yaw (drift angle - difference between velocity ground track and true heading).

Our proposal has encompassed all items mentioned in the memorandum. One requirement which was stressed and which we must review is the ability to obtain elapsed time, exactly, from our recorded data (frame to frame). Real time is not a problem.

Reducing data, either from recorded displays read visually or by digital readout, to titling was discussed. It appears that recommended titling requirements will be:

Camera No.
Mission Number
Date
Security Classification
Frame Number



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The camera number will serve as the index for exact lens focal length for any measurements which might be required.

Mission number and date are for filing and recording purposes as in security classification.

Frame number count will be supplied by HTA and may skip portions of the original negative which might not be pertinent to mission goals.

At present, there is no intent to have more than one security code word or classification, although it is recognized that this could change.

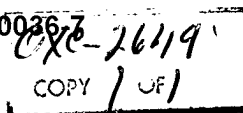
It seems as though our fixed data approach is satisfactory and this data plus the frame number should appear on negative titles.

After discussing the variable data requirements, the following approach was suggested to fill our data collecting responsibilities. It might be mentioned that those in attendance at the meeting are more receptive to digital (magnetic-tape) coding than that of any other form.

The enclosed block diagram is recognized as being over-simplified but served to describe the system. The data from the INS and camera control circuitry would be simultaneously recorded on two magnetic tapes in the vehicle. An optical projection system would record a correlation index on the film simultaneously with recording of digital information, as well as that same correlation index on the tape. (It would be an added feature to have the film correlation index in digital so that it could be used in a fast frame look-up system.) When the tapes are returned to our facilities, they would first be run through a comparator and verified on a one for one bit basis. After verification, our tape would be immediately sent to HTA and would take the place of a tracker camera film. All data of the flight path type could be extracted from the tape and plotted without further search or reduction. Computers could also be programmed with flight data preparatory for film handling. This tape would be the HTA master record and would subsequently be filed with the film. The other tape would be used by our facilities to cut paper tapes for those users requiring the data. Paper tape would permit use of perforated tape-typewriters to print out all information in those installations which do not now have computers.

Advantages of system:

1. Simple control circuitry.
2. Simple recording driver circuitry.
3. Electrical parity generation capability.
4. Elimination of requirement of tracker camera.
5. Delivery of flight path and vehicular conditions information to HTA before any film processing.



6. Dual tape recording back-up.
7. Saving of weight.
8. Capability of using existing perforated paper tape handling equipment.
9. All magnetic tape and paper verification and tape duplication can be accomplished in our facilities without need for typeout.
10. Rapid roll transport access capability.

After considerable discussion of capabilities of a tape system and the advantages and disadvantages of digital recording on film, we were joined by:

Col. M.
Bill I. (MH)
Rod S. (PE)
John R. (PE)
Chris M.

The meeting began to take on the complex of a miniature suppliers meeting. A continuation of the discussion of the feasibility of recording data on magnetic tape was carried on. Evidently this technique had originally been suggested by MH and discarded after Rod S. group had gone to display recording. Bill I. gave a rundown on available recording accuracies which now exist.

1. Ground velocity with .1 or .2%.
2. Pitch and roll from 7 minute synchro to probable accuracy of $1/4^\circ$.
3. Altitude compute from V/H and velocity vector within $1/2\%$ to 1% .
4. Time precision frequency of 14.4 kc
7.2 kc
400 cycles

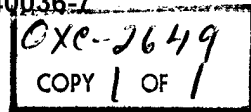
Time clock accurate to 16 parts per million.

5. Longitude and latitude within one mile. Accuracy of INS is within 3 miles after 3 hours, and 5 miles after $4\frac{1}{2}$ hours. INS computer uses binary code in the computer section, 28 bits, 23 magnitude bits, 1 sign bit. A parity check system is used. There is no built-in output shift register as would be needed to record in the desired manner.

As a result of the discussion, it was suggested that the correlation number could be latitude and longitude. This would provide a recording redundancy which would enhance the reliability of the overall system.

At the termination of the discussion, it was agreed that Myron K. would firm up tolerances and data requirements and submit them to Rod S.

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and our own group. It was also generally agreed that the dual recording system on magnetic tape would yield all answers required by HTA and would replace, in their operations, any requirements which might exist for a tracker. A tracker camera would become a consideration only if the cartographic type could prove a great need for a small, low definition frame camera and could justify the 5-6 pounds required.

BLE:LB

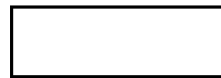
Enc.

cc: R.A.G.

E.L.G.

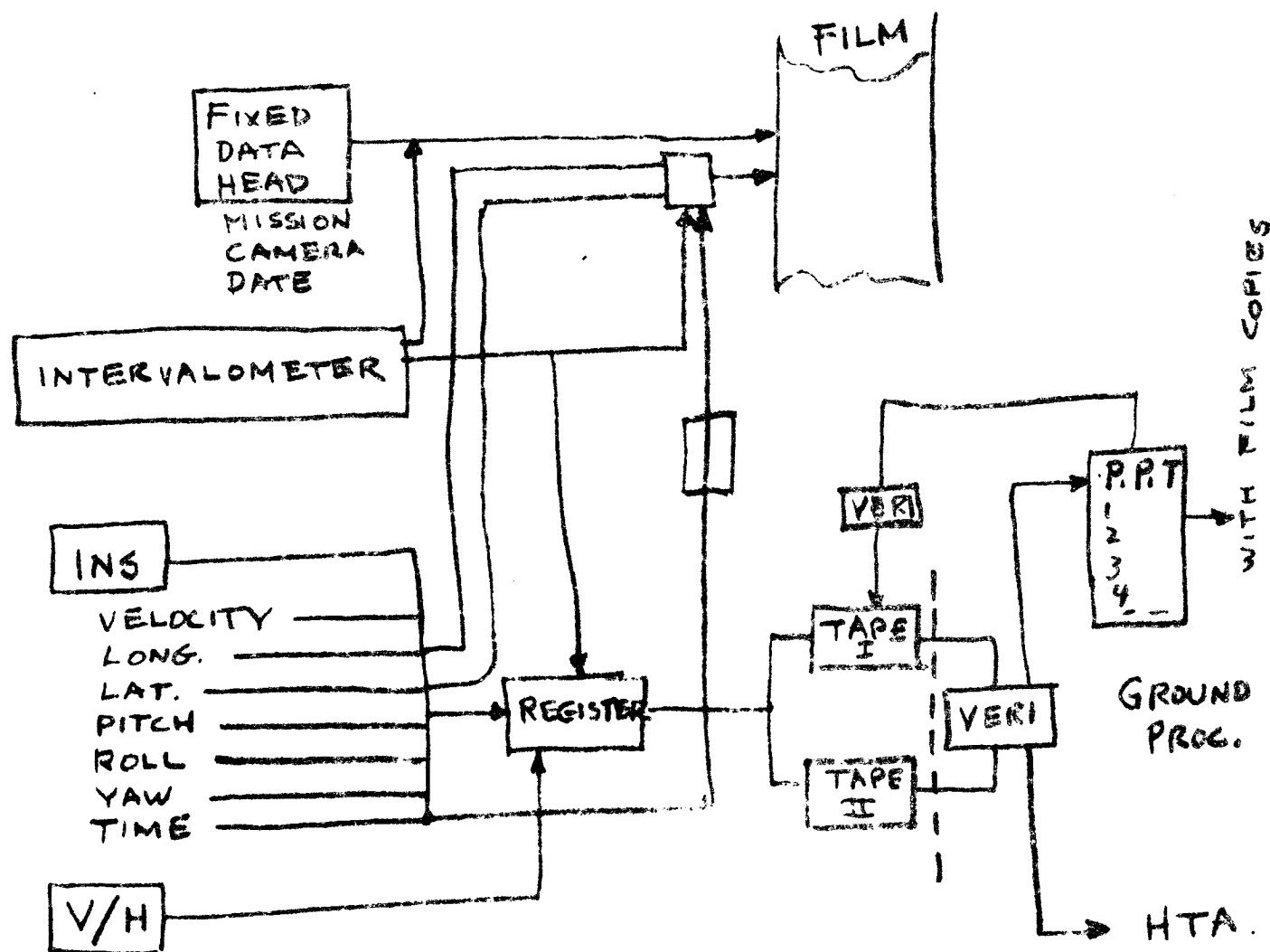
A.B.S.

C.F.H. 11/13/61



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Encl #1
CX-2649
COPY 1 OF 1



DATA SCHEMATIC - "G" SYSTEM.
MAGNETIC TAPE RECORDING

USE OF LONG - LAT. DIGITS FOR
CORRELATION NUMBER

F.E 11-9-61